
Insight 15
December 1999

Eating Breakfast Greatly Improves Schoolchildren's Diet Quality

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We reported in a previous *Nutrition Insights* that the quality of most American children's diet needs improvement. According to 1994-96 survey data, 88 percent of children ages 6 to 18 have a diet that is poor or needs improvement; only 12 percent have a good diet. While numerous studies have examined the contribution of breakfast in improving behavior and learning at school, the contribution of eating breakfast, particularly through the School Breakfast Program (SBP), to overall diet quality has received less attention. The SBP offers a nutritious breakfast to all children who attend schools participating in the program. This *Nutrition Insights* examines the association of children eating breakfast with the overall quality of their diet. Data from the 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII) were analyzed. The CSFII is a nationally representative survey containing information on people's consumption of foods and nutrients. The quality of children's diet was assessed by using the Healthy Eating Index (HEI).

Children between the ages of 6 and 18 (school-age children) in low- and higher income households were examined separately because diet quality varies by household income level. Households with an income below 185 percent of the poverty threshold were defined as low income because this is the income

cut-off for children in these households being eligible for a free or reduced-price school breakfast or lunch. Data collected during a weekend, the summer, or December were omitted in order to examine the effects of the SBP; the data thus represented a typical school day. The sample size used in this analysis was 1,295 children. Data were weighted to represent the population.

The Healthy Eating Index

The HEI, computed on a regular basis by the U.S. Department of Agriculture (USDA), is a summary measure of the overall quality of people's diet. The Index is based on 10 components. Five components measure the degree to which a person's diet conforms to the USDA's Food Guide Pyramid serving recommendations for the major food groups: Grains (bread, cereal, rice, and pasta), vegetables, fruits, milk (milk, yogurt, and cheese), and meat (meat, poultry, fish, dry beans, eggs, and nuts). Four components measure the compliance with dietary recommendations for total fat, saturated fat, cholesterol, and sodium intake. The final component evaluates the extent of variety in the diet.

Each component of the Index has a maximum score of 10 and a minimum score of zero. The maximum overall score for the 10 components combined

is 100. High component scores indicate intakes close to recommended ranges or amounts; low component scores indicate less compliance with recommended ranges or amounts. An HEI score above 80 implies a good diet, an HEI score between 51 and 80 implies a diet that need improvement, and an HEI score less than 51 implies a poor diet.

Children's Consumption of Breakfast

Overall, 67 percent of children in low-income households ate breakfast at home or some place other than school, such as a restaurant/fast-food establishment, 19 percent ate breakfast at school, and 14 percent did not eat breakfast (fig. 1). For children in higher income households, 82 percent ate breakfast at home or some place other than school, 16 percent did not eat breakfast, and 2 percent ate breakfast at school (fig. 2).

Effects of Breakfast Consumption on the HEI

Children in both low- and higher income households who consume breakfast had a higher overall HEI score than children who do not consume breakfast. (HEI scores were not calculated for children in higher income households who ate breakfast at school because of the small sample size.) Among children in low-income households, those who ate a school breakfast had a statistically significant higher HEI score (67) than children who ate breakfast at home or elsewhere (63) and children who did not eat breakfast (57) (see table). All groups of children, however, had an average HEI score that indicates their diet needs improvement.

For the HEI components, regardless of income level, children who ate breakfast

had significantly better component scores for grains, fruits, milk products, and variety than children who did not eat breakfast. The differences are particularly noticeable for children in low-income households who ate a school breakfast. Among children in low-income households, those who ate a school breakfast had an average fruit score of 5.4, compared with 2.1 for those who did not eat breakfast. Likewise, among children in low-income households, those who ate a school breakfast had an average milk score of 8.8, compared with 4.4 for children who did not eat breakfast. Milk is a required food in the SBP, and fruit juice is one of the most frequently served foods in the SBP. The average variety score for low-income children who ate a school breakfast was 9.0, compared with 6.2 for low-income children who did not eat breakfast.

Children in low-income households who ate a school breakfast had a significantly lower HEI component score—meaning less compliance with the recommendation—for saturated fat (3.7) than children who ate breakfast elsewhere (5.4). The reasons for this are unclear and may not be directly attributable to the SBP. However, some schools participating in the SBP serve foods relatively high in saturated fat, such as sausages and butter. Among children in higher income households, those who ate a breakfast had a better total fat score than those who did not eat breakfast.

Do Results Hold After Controlling for Other Factors?

Figure 1. Breakfast consumption: Children in low-income households

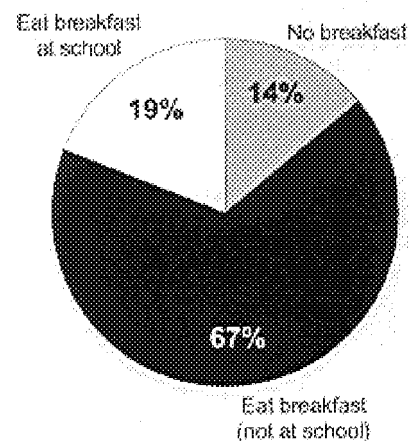
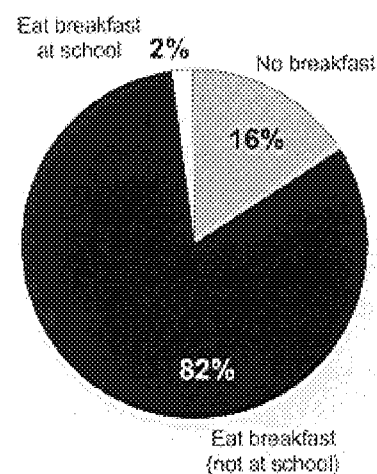


Figure 2. Breakfast consumption: Children in higher income households



HEI and component scores by breakfast consumption: Children in low- and higher income households

	Low income			Higher income	
	No breakfast	Eat breakfast		No breakfast	Eat breakfast
		Not at school	At school		Not at school
Overall HEI	57 ^a	63 ^b	67 ^c	60 ^a	68 ^b
Grains	5.9 ^a	7.3 ^b	7.1 ^b	6.4 ^a	7.6 ^b
Vegetables	5.9	5.7	5.9	6.1	5.5
Fruits	2.1 ^a	3.7 ^b	5.4 ^c	2.6 ^a	4.6 ^b
Milk	4.4 ^a	6.5 ^b	8.8 ^c	4.7 ^a	7.2 ^b
Meat	6.2	6.4	6.9	6.1	5.5
Total fat	6.3	6.6	6.0	6.4 ^a	7.5 ^b
Saturated fat	5.0	5.4 ^a	3.7 ^b	5.4	6.2
Cholesterol	8.5 ^a	7.3 ^b	7.9	8.3	8.9
Sodium	6.7	6.1	6.3	6.8	6.2
Variety	6.2 ^a	8.1 ^b	9.0 ^c	6.8 ^a	8.5 ^b

Note: Means with different superscripts are significantly different at .05.

It could be that other factors besides consuming breakfast, particularly a breakfast at school, are affecting the diets of children. These other factors include household characteristics (income, size, region/urbanization, and food stamp participation) and child characteristics (age, gender, race, ethnic origin, vitamin/mineral use, health status, and being on a special diet). Multivariate analysis is a statistical method that takes into account the effects of these other factors. Such analysis confirmed the descriptive results of this study. Among children in both low- and higher income households, those who ate breakfast had a statistically significantly better overall diet, as measured by the HEI. Children

who ate a school breakfast had an even better overall diet. For all children, consuming breakfast was associated

with higher grain, fruit, milk, and variety scores; eating a breakfast at school was associated with even better fruit, milk, and variety scores.

Clearly, then, breakfast is a very important contributor to the quality of American schoolchildren's overall diet.

Note: For more details on the Healthy Eating Index and how it is computed, the reader should see Bowman, S.A., Lino, M., Gerrior, S.A., Basiotis, P.P. 1998. *The Healthy Eating Index: 1994-96*. U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. CNPP-5. This report is available at <http://www.usda.gov/cnpp>.

